REMARKS

This amendment is in response to the Examiner's Office Action dated 8/17/2004. Applicant is appreciative for the recognized allowable subject matter. This amendment should obviate outstanding issues and make the remaining claims allowable. Reconsideration of this application is respectfully requested in view of the foregoing amendment and the remarks that follow.

STATUS OF CLAIMS

Claims 1-9 are pending.

Claims 1-9 stand rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 1-3 and 8 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeshima et al. (USP 6092113) in view of Vaid et al. (USP 6078953).

Claim 4 was objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Claim 5 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeshima et al. in view of Vaid and further in view of Packer et al. (USP 6456630).

Claims 6 and 9 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeshima et al. in view of Vaid and further in view of Doshi et al. (USP 6529499).

In the Drawings:

Applicant has amended Figure 3 to address the examiner's objections to the drawings. Applicant has provided a marked-up copy of Figure 3 indicating the change in red, as well as a corrected formal drawing. Further, in accordance with the examiner's instruction, Applicant has labeled the drawing sheet as "Replacement Sheet".

Claim 7 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Maeshima et al. in view of Vaid and further in view of Doshi and further still in view of "Multiprotocol Label Switching Architecture," hereafter MPLS, by Rosen et al.

OVERVIEW OF CLAIMED INVENTION

The presently claimed invention is a system and method for allocating a minimally sufficient bandwidth for an IP tunnel in a VPN network by aggregating a path request bandwidth with a pre-existing minimally sufficient bandwidth. Because the bandwidth of a communication path between two user sites is limited by the link allocated the last bandwidth along the path, a first access line bandwidth is compared with a second access line bandwidth to determine the smaller of the two, known as the path request bandwidth. The path request bandwidth is subsequently aggregated with paths already allocated for communication between a common first and second user site, if any happen to exist. Thus, minimally sufficient on-demand bandwidth allocation is achieved. In this manner, resources are conserved by simply allocating as much as necessary to satisfy maximum possible traffic requirements of the limiting link and aggregating upon that initial bandwidth as more paths between the same to sites are added.

REJECTIONS UNDER 35 U.S.C. § 112, 2nd Paragraph

Claims 1-9 stand rejected under 112, second paragraph, as being indefinite. Applicant believes the aforementioned amendments to the claims overcome these rejections. Specifically, each occurrence lacking antecedent basis was corrected. No new matter has been added.

REJECTIONS UNDER 35 U.S.C. § 103(a)

With regard to independent claims 1 and 8, the examiner has referenced Maeshima et al. (hereafter, Maeshima) as disclosing a calculation and allocating of an aggregate bandwidth. Rather, Maeshima disclose a method for reserving a maximum amount of bandwidth necessary, ahead of time, via a plurality of processors in a single router. With the Maeshima method, the RSVP protocol is required to reserve the necessary bandwidth. Specifically, the examiner has pointed to elements of figure 1, which show simply LAN users connecting via intermediate routers to form an IP tunnel; this is well known in the art and is simply used to demonstrate the general network model to which the Maeshima system is applied. Please refer to column 2, lines 44 and 45.

Furthermore, the examiner has pointed to column 3, lines 48 through 62 and column 5, lines 31 through 39 as providing for the calculation of a minimally sufficient bandwidth for interconnecting two user sites, and for allocating a bandwidth based on this calculation to the nodes between which communication is requested.

However, a closer reading of these sections shows a discussion of the limitations of the RSVP protocol and using a packet scheduling (Weighted Fair Queuing) in order to control the access to the allocated bandwidth. Thus, packets having a higher priority are guaranteed access to the communication medium; this is done to prevent a packet free-for-all. On the other hand, the method of the present invention addresses the efficiency of the bandwidth allocation process itself, not the manner in which packets are allowed access to the communication medium, and therefore transmission along a communication path. Additionally, the Maeshima reference does not discuss modifications or alterations to the original RSVP algorithm, rather it discusses a

request for an assurance that the necessary amount of bandwidth is free, which in turn acts as a reservation of the bandwidth and its content to be transferred.

The examiner has also cited Vaid et al. (hereafter, Vaid) as disclosing a method for obtaining an optimal amount of bandwidth over which communication between two sites may take place. However, the Vaid reference actually discloses a quality of service (QoS) monitoring tool, and how such a tool requires the use of flow control and queuing techniques. The Vaid method actually increases and decreases the amount of time necessary to transmit and receive a packet and is typically employed when the amount of traffic far exceeds the available bandwidth, specifically, when link utilization approaches a maximum and when throughput begins to decrease. In stark contrast, the method of the present invention is to handle the scenario in which there is enough available bandwidth and throughput is at a maximum, i.e. to keep a communication path between sites from being underutilized.

The examiner has specifically pointed to column 4, lines 10 through 12 and column 2, lines 27 through 32 of the Vaid reference as providing for the limitation of the throughput in a communication path by the smaller of the two access links between originating or destination end of the path. A closer reading of this passage indicates differences in end point processing constraints (e.g., buffer space and server CPU capacity) as becoming the limiting factor in communication path between nodes. Even if the selected passage read as the examiner has argued, it is respectfully pointed out that the quoted section discusses a principle of network operation, and not the determination of a new aggregate bandwidth based on path request bandwidth constraints and pre-existing communication paths. In other words, the present invention speaks to limiting the further allocation and aggregation of existing bandwidth based on the limiting factor of an access line having the smallest bandwidth.

The Vaid reference is included primarily for its discussion of traffic control, the Vaid reference seeks to shape traffic based on whether the traffic is TCP or non-TCP. The non-TCP traffic is subject to queuing, whereas TCP traffic is subject to flow control. By contrast, non-TCP traffic, specifically, IP traffic transmitted over an IP tunnel, is not subjected to queuing mechanisms of any kind with the instant system and method.

The examiner has recited the exact language of the remaining dependant claims (2, 3, 5 through 7, and 9) and has suggested a correlation with the Packer et al. (hereafter Packer), Doshi et al. (hereafter Doshi), and non-patent literature, "Multi-protocol Label Switching Architecture", to Rosen et al. (hereafter, Rosen) references. The previous arguments presented with respect to independent claims 1 and 8 substantially apply to dependent claims 2, 3, 5-7, and to 9, respectively, in at least the limitations inherited from the claims upon which they depend. Specifically, the examiner has not set forth any elements in Packer, Doshi, or Rosen that provide for the claimed features. It is our position that the references in and of themselves, or any combination thereof, do not describe or suggest these claimed features.

With regards to claim 5, the Packer reference speaks to changing the added to the partition size and bandwidth reallocated for a particular partition, not an aggregate. In other words, the amount of available bit rate is always the same but changes in accordance with a committed information rate, not with the necessary sufficient bandwidth determined by a minimum speed access link.

With regards to claim 6 and 9, the Doshi reference speaks to a quality of service guarantee for voice and other priority traffic, based on remaining available capacity over the IP network. No mention is made of how the available bit rate is allocated, nor how that available bandwidth in increased or decreased. Furthermore, there is no mention of allocating bandwidth based on access link maximum bandwidth.

With regards to claim 7, the Rosen reference speaks to route selection, and hop by hop routing. No mention is made of bandwidth; rather the reference provides a discussion of a dynamic path chosen by a node based on link state information. By contrast, the IP tunnel over which a VPN is formed, remains constant, no mention is made how route selection is made.

The claims of the present invention include at least the following elements not provided for, nor suggested, by Maeshima, Vaid, Doshi, Packer, and Rosen, singularly or in combination:

- aggregation of exiting paths;
- path request bandwidth determined by a virtual site bandwidth if a vitual site having a host or a gateway to other networks used by the user is connected to said inter-site connection network;
- adding and subtracting bandwidth allocation based on communication paths being added or deleted;
- specifying a transit node or transit nodes through which said bandwidth allocation message is transferred; and
- transmitting a bandwidth allocation message in a forward or backward direction along a communication path.

SUMMARY

As has been detailed above, none of the references, cited or applied, provide for the specific claimed details of applicant's presently claimed invention, nor renders them obvious. It is believed that this case is in condition for allowance and reconsideration thereof and early issuance is respectfully requested.

This Amendment is being filed with a Petition for Extension of Time. The Commissioner is hereby authorized to charge the petition fee, as well as any deficiencies in the fees provided to Deposit Account No. 50-1290.

If it is felt that an interview would expedite prosecution of this application, please do not hesitate to contact applicant's representative at the below number.

Respectfully submitted,

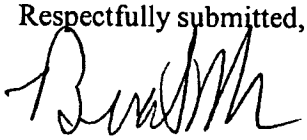

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FIG. 3

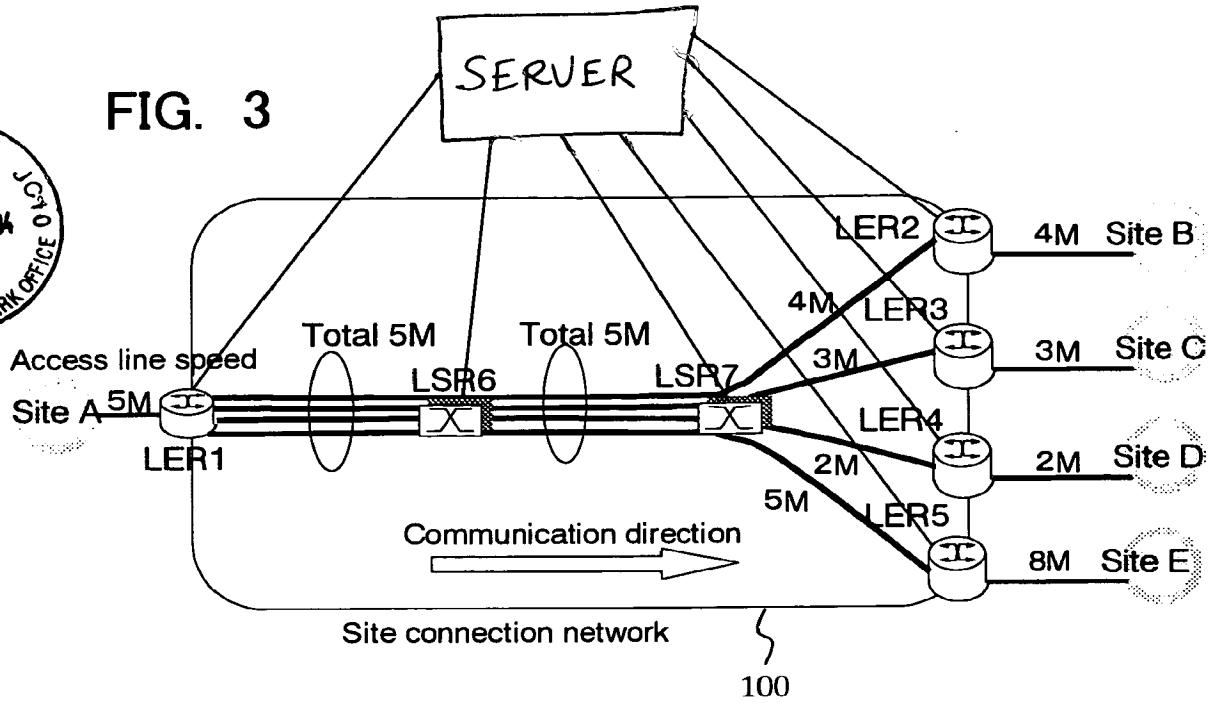

FIG. 4A

Path management table after setting paths between sites A & B

Aggregation Path ID	Aggregation bandwidth	Group ID	Originating site	Originating bandwidth	Destination site	Destination bandwidth
0001	4M	G-1	A	5M	B	4M

FIG. 4B

Path management table after setting paths between sites A & C

	Aggregation Path ID	Aggregation bandwidth	Group ID	Originating site	Originating bandwidth	Destination site	Destination bandwidth
a	0001	5M	G-1	A	5M	B	4M
b	0001	5M	G-1	A	5M	C	3M